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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,909	08/22/2003	Chikara Yamamoto	KAW-304-USAP	8553
28892	7590	02/18/2005	EXAMINER	
SNIDER & ASSOCIATES P. O. BOX 27613 WASHINGTON, DC 20038-7613			SEVER, ANDREW T	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/645,909

Applicant(s)

YAMAMOTO, CHIKARA

Examiner

Andrew T. Sever

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/31/2005 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1-3, 5-9, 11-15, 17, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by O'Connor et al. (US 6,672,722.)

O'Connor teaches in figure 1 a projector optical system comprising:

A digital micromirror device (SLM which is taught in column 1 lines 22-26 can comprises of a digital micromirror device (DMD)) for modulating illumination light, the digital

Art Unit: 2851

micromirror device including minute mirror elements with variable light-reflecting directions, the minute mirror elements being arranged regularly within a plane so as to correspond to respective pixels of an image, each minute mirror element switching, according to a video signal fed therein, between two states having respective angles of rotation different from each other so as to selectively reflect the illumination light into one of first and second directions; (This is the inherent method by which a DMD operates, see for example US 5,061,049 to Hornbeck, US 5,535,047 to Hornbeck, US 2003/0016335 to Penn, US 6,582,080 to Gibbon et al.)

An illumination optical system (comprising of at least the light source and plate polarizer) for outputting a luminous flux having a uniform polarization direction incident on a polarization separating surface of a luminous flux separating means (102 and 103 are luminous flux separation means);

A projection optical system for projecting onto a predetermined projection surface the luminous flux modulated by the digital micromirror device (not shown in figure 1 but inherent in a projection display device (see column 1 lines 6-9)); and

Luminous flux separating means (102 and 103) for making light from the illumination optical system incident on the digital micromirror device and guiding to the projection optical system the illumination light modulated by the digital micromirror device and emitted in the first direction;

Wherein the luminous flux separating means has a polarization separating surface for separating a luminous flux incident on the digital micromirror device and a luminous flux emitted from the digital micromirror device from each other; (103 and 102 are polarization beam splitters) and

Art Unit: 2851

Wherein polarization direction rotating means (1/4 wave plates) for rotating a polarization direction is disposed between the polarization separating surface and the digital micromirror device.

With regards to applicant's claim 2:

The luminous flux separating means is a prism member.

With regards to applicant's claim 3:

The rotating means is a quarter-wave plate.

With regards to applicant's claim 5:

See cube 103 and the red color path: S-polarized light is reflected towards the DMD upon modulation and reflection the image light now P-polarized light is transmitted through the polarization separating surface towards the projection optical system (which would inherently be after the G/M filter after cube 104.)

With regards to applicant's claim 6:

The system is for a projector.

With regards to applicant's claims 7-9 and 11-15, 17, and 18:

See above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 10, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Connor et al. (US 6,672,722) as applied to claims 1-3, 5-9, 11-15, 17, and 18 above, and further in view of Cannon et al. (US 6,726,332.)

As described in more detail above, O'Connor teaches a projector optical system.

O'Connor does not specifically teach the projection optical system for projecting the luminous flux of what form it takes. Cannon et al. In column 4 lines 1-9 teaches that in projection optical systems for DMD systems such as O'Connor's; a telecentric projection optical system is typically used. Given the teaching of Cannon that it is typical to use telecentric projection optical systems due to the performance characteristics of DMD's, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a telecentric projection optical system in the projector optical system taught by O'Connor et al.

Response to Arguments

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment overcame the rejection based on Jung, however O'Connor teaches applicant's new claim language in figure 1. With respect to applicant's arguments not related to the means for making the luminous flux have a uniform polarization direction being separate from the the luminous flux separating means applicant is directed to the arguments presented in the final rejection mailed on 11/9/2004 substituting the appropriate parts of O'Connor for those of Jung when appropriate.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,779,893 to O'Connor et al. For example teaches in figure 2 a luminous flux separating means (24), DMD's (28 and 32), quarter wave plates (26 and 30) and projection lens (40).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

Art Unit: 2851

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AS


JUDY NGUYEN
SUPERVISORY PATENT EXAMINER